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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/045,118 03/20/98 SUZUKI

K 980268

EXAMINER

023850 MM91/1015  
ARMSTRONG, WESTERMAN, HATTORI,  
MCLELAND & NAUGHTON, LLP  
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WASHINGTON DC 20006

BEREZNY, N

ART UNIT

PAPER NUMBER

2823

DATE MAILED:

10/15/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

**Office Action Summary**

Application No.

09/045,118

Applicant(s)

SUZUKI ET AL.

Examiner

Neal Berezny

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 February 2001.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29,31,33-35,37-39,41 and 42 is/are pending in the application.
- 4a) Of the above claim(s) 1-27 and 42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 28,29,31,33-35,37-39 and 41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 March 1998 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 14 February 2001 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All   b) ☐ Some \*   c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Acknowledgement***

1. Examiner acknowledges and confirms applicant's statements regarding the telephone interview on 2/5/01, regarding the period of response discussed in applicant's response on 2/14/01.
2. Examiner acknowledges applicant's previous election without traverse of invention II, claims 28-41, drawn to a semiconductor device. Claims 1-27 and now new claim 42 are withdrawn from consideration as being drawn to a non-elected invention.

### ***Drawings***

3. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the principle of the present invention, as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Figs. 3-14 are replete with errors, contradictions, and vague, indefinite, and incomplete information. As an example, but by no means a complete list, the following are provided:

A. The terms Q and Pm have not been defined or described in either the drawing or the specifications.

B. Figs. 9-12 are difference plots but the powers referred to are at different levels and sometimes inconsistent. See also p.16, ln.27 to p.17, ln.19, p.20, ln.15, and p.27, ln.12.

C. Many of the plot lines are not labeled, and those that are labeled it is not clear which lines that cross and overlap, are continuations of the labeled lines and which are not.

Correction is required.

### ***Specification***

4. The specifications are objected to. Note that 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms, which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are:

- A. P.16, ln.4-5, the ratio of N2O to H2O appears to be an error.
- B. P. 15, ln. 27, plasma power of 200C.
- C. P.27, ln.12, and p.20, ln.15, the power level is reported as 50 kW, but fig.9-12 report power levels ranging from 50 to 200 W.

5. A substitute specification excluding the claims is required pursuant to 37 CFR 1.125(a) because applicant has been given able opportunity to correct the above cited problems, both in the drawings and the written description, but has failed to correct or address all of the examples cited by examiner, yet alone all the errors in the specifications. It would be too cumbersome for both the examiner and the printer to

piece together changes spread out over several amendments. Further, applicant is reminded that applicant has the burden to insure that the specifications are proof read prior to submission of the application to the office. Finally, applicant appears to have introduced new matter into the changes that were made. Applicant has failed to identify in the specification where such changes have not introduced new matter. Furthermore, applicant has not made any statement stating that the amendments to the specifications and the claims do not contain new matter.

6. A substitute specification filed under 37 CFR 1.125(a) must only contain subject matter from the original specification and any previously entered amendment under 37 CFR 1.121. If the substitute specification contains additional subject matter not of record, the substitute specification must be filed under 37 CFR 1.125(b) and must be accompanied by: 1) a statement that the substitute specification contains no new matter; and 2) a marked-up copy showing the amendments to be made via the substitute specification relative to the specification at the time the substitute specification is filed.

7. The SUMMARY OF THE INVENTION from pages 6 to 13, is mostly a verbatim copy of the claims. This does not meet the objectives of the summary in 37 CFR 1.73 which states that "A **brief** summary of the invention indicating its nature and substance, which may include a statement of the object of the invention, should precede the detailed description." A further elaboration of this is given in MPEP 608.01(d) which

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states "Since the purpose of the brief summary of invention is to apprise the public, and more especially those interested in the particular art to which the invention relates, of the nature of the invention, the summary should be directed to the specific invention being claimed. That is, the subject matter of the invention should be described in one or more clear, concise sentences or paragraphs." Claims are written in legal language to specify in broad terms the legal limitations of the invention, and are not intended to provide technical information to the public about the nature of the invention.

8. The first paragraph of 35 U.S.C. 112 states that "The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, **concise**, and exact terms as to enable any person skilled in the art to which it pertains". The legal language utilized for claims to set the metes and bounds of the patent protection does not fulfill this requirement. In addition, 37 CFR 1.75 (d) sets up the criteria that the specification is a dictionary for the claims and should provide clear support or antecedent basis for all terms used in the claims. Since the SUMMARY OF THE INVENTION merely duplicates the claims, it is not providing support for the claims. The specifications are objected to for failing to satisfy the requirements of the SUMMARY OF THE INVENTION.

9. The second paragraph of 35 U.S.C. 112 states that "The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention". Since the claims are given at the end of the specification, it is redundant and superfluous to include them as part of the summary.

10. Since rules 37 CFR 1.73 and 37 CFR 1.75 clearly identify the SUMMARY OF THE INVENTION as a section which is separate and distinct from the CLAIMS and the other sections, the intended objective was not to provide an exact copy of the claims in the SUMMARY.

Appropriate correction is required.

### ***Response to Amendment***

11. The amendment filed 2/14/01 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

A. Replacement paragraph beginning at p.16, ln.27, lacks support in the specifications and applicant is required to both identify support and make a statement that no new matter had been entered.

B. Replacement paragraph beginning at p.17, ln.9, lacks support in the specifications and applicant is required to both identify support and make a statement that no new matter had been entered.

Applicant is required to cancel the new matter in the reply to this Office Action.

### ***Claim Rejections - 35 USC § 112***

12. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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13. Claims 28-29, 31, and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Independent claim 28 states the limitation in the last line of the claim, "first insulation film **contacts** H<sub>2</sub>O". This change in the recently submitted claims, which had not been indicated as an amendment, is likely to be an error and needs correction.

***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 28, 29, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in combination with Toyotaka (JP 07135208 A) and Oda (JP 6-204420 A). AAPA forms a semiconductor device with a substrate, fig.1c, el.1, gate electrode, el.3a, diffusion region, el.1A and 1B, sidewall insulator, fig.1d, el.3a and 3b, self-aligned contact hole, fig.1h, el.1c and 1d, first insulator, fig.2, el.6, second insulator, el.4, interlayer insulator, fig.1f, el.5, and contact hole in interlayer insulator and through first and second insulators, fig.1g, el.5a and 5b. Official notice is taken that it is inherent that a conductive pattern is formed in the contact hole to make contact to the devices so that they can be used in an electronic



circuit. AAPA does not teach the reduced water content in the first oxide. Toyotaka teaches forming an insulating film with removed H<sub>2</sub>O. It would be obvious to one skilled in the art to combine the teachings of Toyotaka with AAPA and remove water from the gate oxide region to reduce the level of interfacial states and increase the device's resistance to the hot electron effect. Further, Oda teaches the well-known art of forming silicide contacts in both the source/drain regions and on the gate electrode. It would be obvious to make silicide contacts since that would reduce the contact resistance of the device and improve performance.

16. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, Toyotaka and Oda as applied to claims 28, 29, and 33 above, and further in view of Lage et al. (5,485,420). Lage teaches forming self-aligned contacts consisting of a conductor pattern, fig.9, el.62, contacting a diffusion region, el.81, and a gate electrode, el.79, such that the conductor extends along a surface of the spacer, el.52. It would be obvious to one of ordinary skill in the art to build well known circuits that have latched gates by forming the interconnect structure of Lage in order to reduce the number of process steps by connecting the gate with the source or drain and also contacting the source, drain, and gate in a single layer/step.

17. Claims 34, 37, 38, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, in combination with Wolf, Vol.2, p.194-198 and Oda (JP 6-204420 A). AAPA forms a semiconductor device with a substrate, fig.1c, el.1, gate

electrode, el.3a, diffusion region, el.1A and 1B, sidewall insulator, fig.1d, el.3a and 3b, self-aligned contact hole, fig.1h, el.1c and 1d, first insulator, fig.2, el.6, second insulator, el.4, interlayer insulator, fig.1f, el.5, and contact hole in interlayer insulator and through first and second insulators, fig.1g, el.5a and 5b. Official notice is taken that it is obvious that a conductive pattern is formed in the contact hole to make contact to the devices so that they can be used in an electronic circuit. AAPA does not teach the use of B and/or P to act as a gettering agent in order to reduced water content in the first oxide. Wolf, p.196, teaches forming an insulating film with B and P at 3-5 wt% each, in order to act as a gettering agent to remove contaminants, such as H<sub>2</sub>O, from sensitive areas. It would be obvious to one skilled in the art to combine the teachings of Wolf with AAPA and use B and P as gettering agents to remove water from the gate oxide region to reduce the level of interfacial states and increase the device's resistance to the hot electron effect. Further, Oda teaches the well known art of forming silicide contacts in both the source/drain regions and on the gate electrode. It would be obvious to make silicide contacts since that would reduce the contact resistance of the device and improve performance.

18. Claims 35 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, Wolf, and Oda as applied to claims 34, 37, 38, and 41 above, and further in view of Lage et al. (5,485,420). Lage teaches forming self-aligned contacts consisting of a conductor pattern, fig.9, el.62, contacting a diffusion region, el.81, and a gate electrode, el.79, such that the conductor extends along a surface of the spacer, el.52. It

would be obvious to one of ordinary skill in the art to build well known circuits that have latched gates by forming the interconnect structure of Lage in order to reduce the number of process steps by connecting the gate with the source or drain and also contacting the source, drain, and gate in a single layer/step.

***Response to Arguments***

19. Applicant's arguments filed 2/14/01 have been fully considered but they are not persuasive. The drawings, summary, and entire specifications are objected to. Independent claim 28 and its dependents are rejected under 112, par.2, and all pending claims under consideration are also rejected under 35 USC 103.

20. Applicant's response to the examiner's previous objection, par.4, item B, fails to overcome the objection because the specifications require that Q and Pm be defined so that a skilled artisan would understand their meanings. The specifications must include a clear description. Further, amending the specifications without identifying support in the specifications for such an amendment constitutes new matter and would also be objected to.

21. Similarly, two of the paragraphs amended are objected to as containing new matter, see the above new matter objections.

22. Applicant's response to the previous action, par.4, item D, is rejected because the issue is not whether or not the drawing **do** contain sufficient information but rather, the issue is if one of ordinary skill in the art could understand the figures. 35 USC 112, par.1, requires the specifications be written in "**full, clear, concise, and exact terms**".

23. Applicant traverses examiner's objection of the Summary section, but incorrectly cites the wrong paragraphs in the examiner's action and mixes parts of examiner's objections imparting confusion. Applicant is again reminded that applicant has the burden to respond in full and insure that the response correctly cites the intended paragraphs. Since applicant has failed to meet their obligation to respond in a clear and full manner, examiner's response is at best a guess as to applicant's intent. Applicant's arguments confuse the requirements of the specifications as a whole in contrast to the requirements for the Summary section. Although it is true that the Summary can include claim language, that is not the issue. The issue is whether, seven pages of mostly claim language that numerously repeats basic steps in building a MOSFET, provides a summary which is in "**full, clear, concise, and exact terms**".

24. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir.

1986). Toyotaka was not used to provide the SAC feature, so applicant's argument is irrelevant.

25. In response to applicant's argument that the alleged absence of knowledge regarding H<sub>2</sub>O in the first insulating film would make the use of a quality oxide non-obvious, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In this case, Wolf provides the motivation to combine the teachings by pointing out on p.195, table 4.4, property 5 and 18, that a good oxide should not absorb or permeate moisture, in order to reduce charge trap densities, and reduce outgassing. Both Toyotaka and Wolf teach that these qualities of an oxide are desirable and such oxides should be used for general applications. One of ordinary skill in the art would find it obvious to use quality oxides in general, and would therefore use such an oxide for the first oxide. The fact that applicant had discovered another reason to provide a quality oxide can not be the sole basis for patentability.

26. In response to applicant's argument that Wolf merely discloses BPSG and allegedly does not relate to gettering of H<sub>2</sub>O, thereby lacking motivation to combine, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the

differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In this case, Wolf teaches a number of art recognized equivalent oxides for the first insulator, and provides several motivations, such as improved reflow properties, as well as the desire to reduce water exposure. It would be obvious to a skilled artisan to use BPSG for the first insulator, to improve reflow, providing for better step coverage, and better sealing the structure from water, which can contaminate and degrade the device performance.

### CONCLUSION

27. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

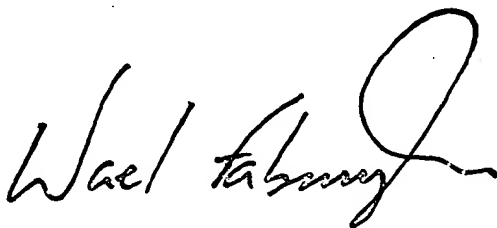
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

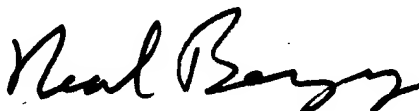
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28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neal Berezny whose telephone number is (703) 305-1481. The examiner can normally be reached on Monday to Friday from 9:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached at (703) 308-4918. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
SUPERVISORY PRIMARY EXAMINER  
TECHNOLOGY CENTER 2800

  
9-30-01

Neal Berezny

Patent Examiner

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